WHAT IS CLAIMED IS:

1. A wedge-operated disc brake apparatus comprising:

a piston accommodated within a cylinder portion to be slidable along an axial direction of the piston and adapted to push a brake pad toward a brake rotor;

an actuator for generating a linear brake-actuating input;

a wedge transmission mechanism which is connected to the actuator so as to be driven thereby and to convert the linear brake-actuating input into a brake-actuating output in the axial direction of the piston, the brake-actuating output being transmitted to the piston so as to cause the piston to push the brake pad toward the brake rotor; and

a resilient member for axially urging the piston toward a direction away from the brake pad.

2. A wedge-operated disc brake apparatus according to claim 1, wherein a bearing is provided between the piston and the cylinder portion in order to enable smooth axial movement of the piston.